O15 - Chlamydia infections

O15.1 SENSITIVE DETECTION OF *CHLAMYDIA TRACHOMATIS* PGP3 ANTIBODY DEMONSTRATES ANTIBODY PERSISTENCE AND CORRELATES WITH SELF-REPORTED INFECTION AND BEHAVIOURAL RISKS IN A BLINDED COHORT STUDY

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Introduction With improvements in serological detection of *Chlamydia trachomatis* (CT) infection and knowledge of persistence of CT antibodies, serological studies in populations could help monitor changes in incidence. The Dunedin Multidisciplinary Health and Development *study, New Zealand,* has regularly monitored the health and behaviour of 1037 men and women since their birth *in 1972–73*. Using this cohort, we report on the association between CT seropositivity and age, sexual behaviour and self-reported infection, as well as CT antibody changes over time.

Methods We developed a Pgp3 double-antigen sandwich ELISA then assayed, blinded, sera obtained from the Dunedin cohort at ages 26, 32 and 38.

Results Seropositivity was associated with a history of CT at all ages, with a stronger association in women than men. At ages 26, 32 and 38 years, 24.1%, 26.2% and 26.8% respectively of women, and 10.7%, 14.0% and 13.1% of men, were CT seropositive. Among those with a self-reported prior CT diagnosis at these ages, 79.5%, 75.0% and 74.6% respectively of women were positive, markedly higher than among comparable men (25.0%, 33.3% and 27.0%). The proportion seropositive increased with the lifetime number of sexual partners at all ages ($p < 0.001$). At age 38, among Pgp3 seropositive individuals 63.3% (95% CI 54.4%–71.4%) of women and 83.1% (71.5%–90.5%) of men did not report having ever been diagnosed with chlamydia. Among women, persistence over six years was 92.5% (85.7–96.7%) and over 12 years 94.3% (87.2–98.1%); among men the respective proportions were 87.3% (76.5–94.4%) and 83.8% (68.0–93.8%).

Conclusion CT infection was common in Dunedin, New Zealand with many infections going undetected. The strong correlation of Pgp3 antibody with number of sexual partners and high persistence of antibody is a powerful argument for the development of methodology to use CT Pgp3 serology for evaluation of CT control programmes.

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O15.2 COMBINED DETECTION OF CHLAMYDIA, GONORRHOEA AND TRICHOMONAS USING THE BD MAX™ CT/GC/TV ASSAY

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Background *Chlamydia trachomatis* (CT) and Neisseria gonorrhoea (GC) are the two most common bacterial STIs. Screening for CT and/or GC, is recommended in many countries. The prevalence of *Trichomonas vaginalis* (TV) is also high and negative consequences of untreated infection may be serious. Inclusion of TV as part of a combination assay would facilitate screening of these STI. Here we evaluated the performance of the BD MAX CT/GC/TV assay compared to currently available assays for these STI.

Methods Eight STD and Family Planning clinics enrolled participants for this study. Vaginal and endocervical swabs, and female and male urine specimens were obtained from 1854 women and 843 men. Female samples were used for evaluation of the BD MAX CT/GC/TV assays while male urine was used only for CT/GC evaluation. BD MAX CT/GC/TV results were compared to the Aptima Combo 2 ® CT/GC; BD ProbeTec™ CT/GC; BD Viper™ CT Q^x/GC Q^x; TV microscopy and culture. Participants were classified as infected if at least one positive result from each of 2 comparator assays were obtained. Positive wet mount and/or culture results were used as evidence of TV infection for women only.

Results Among women, 7.3%, 2.4% and 14.7% were infected with CT, GC and TV, respectively. Among men the rates were 22.0% and 14.6% for CT and GC. The BD MAX CT/GC/TV assay detected 92.2–99.2%, 94.9–95.1% and 92.9–96.1% of CT, GC and TV infections among women, depending on specimen type, and 96.6% and 99.1% among men. The specificity for all organisms and sample types was >98.5%.

Discussion In this US multi-site study, the prevalence of TV infection was high, demonstrating the benefit of screening women for TV as well as GC and CT. The BD MAX CT/GC/TV assay performance allows combined testing for all 3 STI among women and CT/GC from male urine.--

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O15.3 HIGH CHLAMYDIA TREATMENT FAILURE RATES IN MEN WHO HAVE SEX WITH MEN

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Introduction There is increasing concern about treatment failure among those treated for anogenital chlamydia infection. We used genotyping and survey data to differentiate between reinfection

and treatment failure among men who have sex with men (MSM), heterosexual men and women, diagnosed with repeat chlamydia infection within 1- 4 months after treatment with azithromycin.

Methods Participants completed an online survey capturing treatment and sexual behaviour data since initial diagnosis. Specimens from initial and repeat infections were included in the study. Chlamydia serovars were determined using quantitative PCR assays. When the same serovar was detected in both specimens for participants, MLST was used to further discriminate between genotypes. An algorithm based on genotype and sexual behaviour data was used to differentiate treatment failure from reinfection.

Results There were 600 participants (200 MSM, 200 heterosexual males, 200 females) diagnosed with chlamydia. Of 301/600 who retested between 1–4 months: 258/301 (85.7%) were cured (treated and negative on retest); 4/301 (1.3%) had a definite reinfection (positive retest and different genotype); 19/301 (6.3%) had probable reinfection (positive retest, same genotype and reported unprotected sex with the same or a different partner); 17/301 (5.6%) had possible treatment failure (positive retest, same genotype and reported not having sex or always using condoms); 1/301 (0.3%) had a persistent infection (positive retest, same genotype and no documented treatment); and 2/301 (0.7%) could not be categorised due to insufficient information. Possible treatment failures were more common in MSM (11.3%, 12/106) vs other groups (2.6%, 5/195; $p < 0.01$). Among the possible treatment failures in MSM, 10/12 (83.3%) were initial rectal samples.

Conclusion Treatment failure was common in MSM with rectal chlamydia, suggesting the need for treatment efficacy trials.

Disclosure of interest statement No conflict of interest is declared.

O15.4 AZITHROMYCIN TREATMENT FAILURE IN WOMEN INFECTED WITH GENITAL CHLAMYDIA INFECTION

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Introduction Repeat infections of chlamydia are very common and may represent a new infection, re-infection from an untreated partner or treatment failure. The aim of this cohort study is to estimate the proportion of women infected with chlamydia who experience failure after treatment with 1 gram azithromycin.

Methods Women diagnosed with chlamydia were followed for 8 weeks post treatment with 1 gram azithromycin and provided weekly genital specimens for further assay. The primary outcome was the proportion of women classified as having treatment failure at least 4 weeks after recruitment. Comprehensive sexual behaviour data collection and the detection of Y chromosome DNA in vaginal swabs and genome sequencing were used to differentiate between chlamydia re-infection and treatment failure. Chlamydia culture and MIC was also undertaken.

Results There were 305 women recruited with a response rate of 66%. A total of 36 women were diagnosed with repeat chlamydia infection during follow up (11.8%; 95% CI: 8.4%, 16.0%). The median time till repeat infection was 7 weeks, with 25% of repeat infections diagnosed within 5 weeks. The risk of repeat infection increased with increasing organism load of initial infection (OR = 1.6; 95% CI: 1.2, 2.8 for each additional log increase in load). Of the 36 women with repeat infection, 16 (44.4%; 95% CI: 27.9%, 61.9%) were classified as treatment failure with an overall risk of treatment failure of 5.2% (95% CI: 3.0%, 8.4%). There was no detectable shift in MIC between initial and repeat infections with MIC within reported antimicrobial susceptibility ranges.

Conclusion Using a combination of advanced laboratory techniques and comprehensive sexual behaviour data, we estimate that about 1 in 20 women with chlamydia infection treated with 1 gram of azithromycin will fail treatment. Further laboratory investigation will determine whether there are any genomic characteristics of the infections associated with treatment failure in our cohort.

Disclosure of interest statement This study was funded by the NHMRC.

O15.5 THE NATURAL HISTORY OF *CHLAMYDIA TRACHOMATIS* INFECTION IN WOMEN: A MULTI-PARAMETER EVIDENCE SYNTHESIS

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Introduction The National Chlamydia Screening Programme (NCSP) was initiated in England in 2003. However, the evidence base supporting it has been questioned repeatedly, with little consensus on modelling assumptions, parameter values, or evidence sources to be used in cost-effectiveness analyses.

Methods We reviewed all the available evidence on the *Chlamydia trachomatis* (CT) in the UK and its sequelae. Evidence was identified using "high yield" strategies. Bayesian Multi-Parameter Evidence Synthesis models were constructed for separate subparts of the clinical and population epidemiology of CT. Where possible different types of data were statistically combined to derive coherent estimates. Where evidence was inconsistent, evidence sources were re-interpreted and new estimates derived on a *post hoc* basis.

Results An internally coherent set of estimates was generated, consistent with a multi-faceted evidence base. Among the key findings were: the risk of pelvic inflammatory disease (PID), both symptomatic and asymptomatic, following an untreated CT infection is 17% (6,29), and the risk of salpingitis is 7% (2,14). In women aged 16–24 screened at annual intervals, at best 61% (55,67) of CT-related PID and 22% (7,43) of all PID could be prevented. For women aged 16–44 in the UK, the proportions of PID, ectopic pregnancy and tubal factor infertility (TFI) that are attributable to CT are estimated to be 20% (6,38), 5% (1,12), and 29% (9,56) respectively.

Conclusion The study establishes a set of interpretations of the major studies and study designs, under which a coherent set of estimates can be generated for UK decision-makers. CT is a significant cause of PID and TFI. CT screening is of benefit to the individual, but detection and treatment of incident infection may